

# Calculus III Honors Spring 2010

## Homework 10

Not to be turned in

**Instructions:** These are some problems to help you review/prepare for the up coming exam. You should be able to justify all your work, as you may need to for the exam. Bring any questions you have to class on Monday, or to office hours.

### Problems

**Problem A:** For each of the following functions, find the associated Maclaurin series and determine its radius of convergence:

- (i)  $\frac{1}{1-x}$
- (ii)  $e^x$
- (iii)  $\sin(x)$
- (iv)  $\cos(x)$
- (v)  $\tan^{-1}(x)$
- (vi)  $\ln(1+x)$
- (vii)  $\frac{x}{2+x^2}$
- (viii)  $\frac{\sin(x^2)}{x}$

**Problem B:** Determine the following integrals:

- (i)  $\int e^{-x^2}$
- (ii)  $\int \frac{\sin(x^2)}{x} dx$ .

**Problem C:** Using a series expansion, write down an approximation for  $\sin(1)$  which is correct within  $\frac{1}{1000}$  (so it is correct up to 3 decimal places, though you don't need to write your approximation as a decimal).

**Problem D:** Use the integral test to determine for which  $p$  the series

$$\sum_{n=1}^{\infty} \frac{1}{n^p}$$

converges.

**Problem E:** Review all your homeworks from Chapter 12.

### Chapter 12 Review (pp. 794–796)

*Concept Check:* 1–12

*True-False:* 1–20

*Exercises:* 2, 5, 6, 8, 11, 12, 14, 28, 31, 59